# SC Water Resources Workshop

May 31, 2006

## The Road Ahead Panel
## SC Water Resource Possibilities

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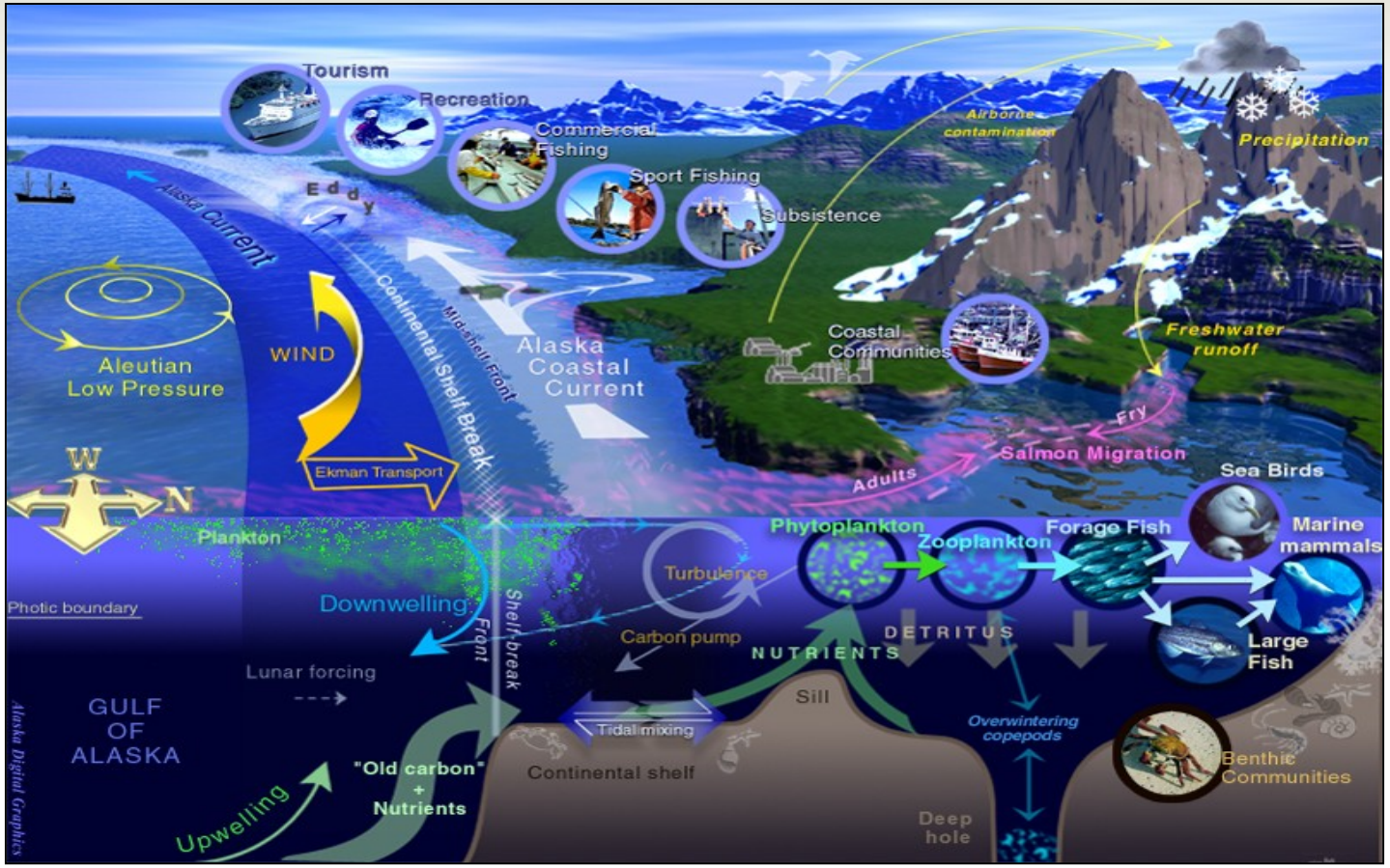
# NOAA's Ecosystem Approach To Management




http://ecosystems.noaa.gov

# NOAA's Ecosystem Definition

**An ecosystem is:**

**A geographically specified system of organisms (including humans), the environment and the processes that control its dynamics.**

**The environment is the biological, chemical, physical and social conditions that surround organisms**

# Characteristics of EAM

**An ecosystem approach to management:**

- **Adaptive**
- **Collaborative**
- **Incremental**
- **Geographically Specific**
- **Accounts for knowledge and uncertainty**
- **Considers multiple external factors**
- **Strives to balance diverse societal objectives**

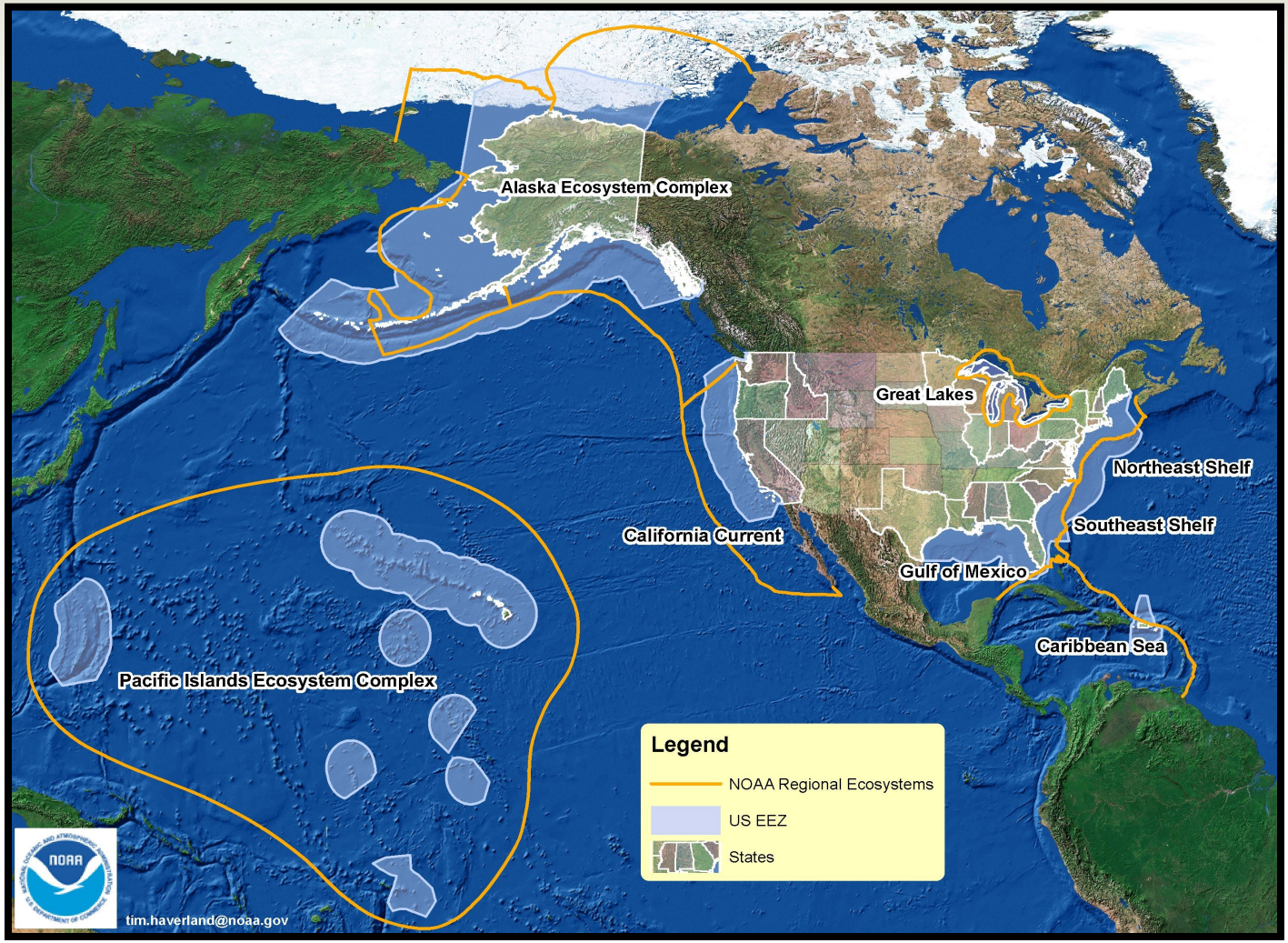
# Ecosystem Mandates: A Paradigm Shift or Evolution?

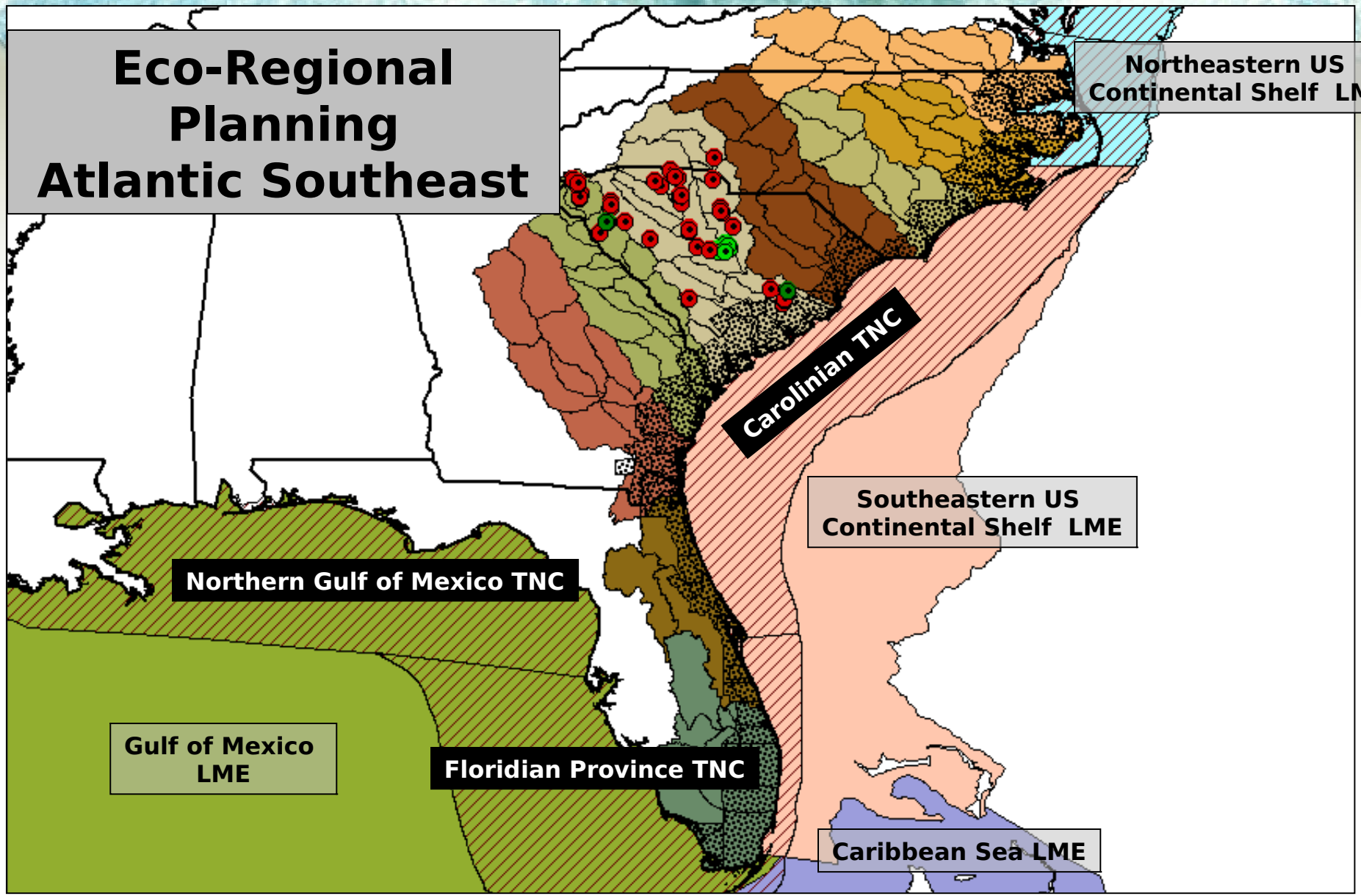
| Current Mandates | Future Mandates |
| --- | --- |
| Individual Species | Multiple Species |
| Narrow Perspective & Scale | Broad Perspective & Scale |
| Human Activities Evaluated for Individual activities | Humans Integral to Ecosystem |
| Resource Management by Sectors | Integrated Resource Management |
| Scientific Monitoring programs Focused narrowly | Adaptive Management Based On Scientific Monitoring |
| Single Use and Purpose Observations | Shared and Standardized Observations |

**Focus on Managing Ecosystem parts**

**Focus on Ecosystem Relationship Processes, and Tradeoffs**

# NOAA Regional Ecosystems




Eco-Regional Planning Atlantic Southeast
Northeastern US Continental Shelf LME
Carolinian TNC
Southeastern US Continental Shelf LME
Northern Gulf of Mexico TNC
Gulf of Mexico LME
Floridian Province TNC
Caribbean Sea LME

# Guerry (2005). Front Ecol Environ 3:202-211

**Table 1. Lessons learned from nearshore marine systems that can help inform ecosystem-based approaches in the oceans**

| *Connection* | *Lessons* | *Conceptual guidance* | *Tactical guidance* |
|---|---|---|---|
| 1. Ecosystem structure, functioning, and services | • provisioning of goods and services depends upon ecosystem functioning<br>• ecosystem functioning depends on ecosystem structure | • provides the foundation for shifting from a single-species to an ecosystem-based approach<br>• strive to maintain the parts of ecological systems and the processes that link them | • research the connections between structure, functioning and services, particularly with a focus on maintaining services<br>• tighten linkages between systems theory and application to management |
| 2. Land and sea | • actions on land can have important ramifications for coastal marine ecosystems<br>• coastal systems can be resilient | • think big: be cognizant of linkages<br>• scales of management should be matched with scales of systems | • manage coastal oceans and bays at a watershed scale<br>• link terrestrial and marine conservation efforts<br>• emphasize monitoring of the status and trends of coastal systems, and impacts of human activities on them |
| 3. Marine environments | • organisms, energy, and nutrients flow between habitats<br>• the pelagic environment plays an important role in determining community structure of the benthos | • recognize the importance of context<br>• acknowledge the uniqueness of places | • identify and protect key habitats, such as nurseries<br>• consider the juxtaposition of of marine habitats in conservation strategies<br>• use regional management |

# Guerry (2005). Front Ecol Environ 3:202-211

| | | | |
|---|---|---|---|
| 4. Species | • species are embedded in complex communities<br>• indirect effects of species interactions can cause unexpected consequences<br>• effects of perturbations can be delayed | • expect surprises<br>• take precautions<br>• expect time-lags<br>• recognize the impossibility of managing each piece of a system in isolation<br>• keep all the players to maintain the natural range of interaction | • monitor<br>• research conditions under which different interaction types are likely to play key roles<br>• use marine protected areas and marine reserves |
| 5. Diverse stressors | • no stressor operates in a vacuum | • consider how stresses interact in natural systems<br>• take precautions | • research cumulative effects of stressors<br>• manage multiple stressors in tandem |
| 6. Knowledge and uncertainty | • marine ecosystems are complex; there are significant uncertainties in their future states | • avoid hubris<br>• do not expect precise predictions of future states | • be explicit about uncertainties; incorporate them into decision making; develop probable scenarios<br>• use insurance policies<br>• manage for resilience |

# Current EAM Activities

Regional integration and assessment activities

- Gulf of Mexico Alliance
- Great Lakes Regional Collaboration
- Northeast Shelf
  - New England Regional Ocean Council
- Southeast Shelf
  - August 2005 Regional Workshop, Regional Conferences March & Sep 2006